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MAN'S INFLUENCE ON AIR COMPOSITION*

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For the purpose of discussing man's influence on air composition, it is essential that we set aside for a moment our usual concept of man as a rational individual, endowed with personality and moral character, and think of him as a machine and as part of the environment. First of all, man is a heat machine with 20 percent thermodynamic efficiency. At rest, respiration and metabolism require approximately 100 B. t. u. of energy per hour and consequently 400 B. t. u. per hour must be successfully wasted. Extreme muscular exertion requires that an additional 900 B. t. u. per hour be converted into mechanical energy and this, coupled with the requirement at rest, means a total energy used of 1,000 B. t. u. per hour, and consequently the successful wasting or loss of 4,000 B. t. u. per hour. Man's body, therefore, is a heat exchanger of no mean proportions.

Unlike most industrial heat exchangers, man's body transfers heat by three methods; namely, convection, radiation and evaporation. To further complicate the picture, both convection and radiation are dependent directly upon a temperature difference (between body surface and air in one case and between body surface and wall surface in the other) which may be large or small, and either positive or negative. Consequently the third factor, that of evaporation, may be assisted by the other two or opposed by them.

With such a complex and varying set of requirements, it is not surprising that human thermal comfort varies widely with individuals and yet this fact is very commonly overlooked. For many years the "Comfort Zone Chart" of the American Society of Heating and Ventilating Engineers has been used as a guide for modifying and controlling indoor air conditions. For summer comfort in still air, this chart specifies those conditions between 66 degrees and 75 degrees effective temperature, and between 30 percent and 70 percent relative humidity. I would like to give one graphic example of the hazard of assuming that human thermal comfort can be so generally defined.

In the spring of 1955, the State Department of Public Health moved into its new eight-story building in Berkeley. Immediately, instead of the expected expressions of pleasure, we were deluged with complaints against poor ventilation by the vast majority of the 700 occupants of this modern new building located in one of the world's most equable climates.

To ascertain the facts we divided the building into 75 stations and twice daily for 10 working days made simultaneous measurement of the temperature and humidity and of the state of comfort or discomfort of the test employees at these locations. Other factors such as air motion, wall temperature, and size of space were also noted or controlled. The results of these measurements were plotted against wet and dry bulb temperature. All but three of the observations fell within the comfort zone chart for summer conditions (the study was made in September) and yet two facts are obvious:

(1) Less than 60 percent of the people tested were comfortable in this range of conditions;
(2) At no one degree of effective temperature were 75 percent of the people tested comfortable.

Another frequently observed phenomenon was that at the same condition of dry and wet bulb temperature (measured to the nearest degree F.) some persons were too hot, some were comfortable, and some were too cold.

One may only conclude from such data as this that we are designing buildings and air conditioning systems to promote human comfort without any precise and reliable knowledge of the air conditions that go with thermal comfort.

Effects of Human Occupants on Indoor Air

In light of the foregoing discussion, let us consider now the effects on indoor air of the presence of this heat-producing machine called "man." One can compute the total heat loading imposed on indoor air by human occupants and estimate as well the moisture loading. In the latter respect it is helpful to know that expired air contains 1.5 percent moisture by volume and an average person breathes

* A condensation of a speech presented at the conference on "Designing the Indoor Climate," University of California at Los Angeles, September 12 and 13, 1957. The entire article will be published by U. C. L. A. as part of the conference proceedings. It has been published, in whole or part, by virtually every journal in the heating and air conditioning field.

15 cubic feet of air per hour at rest and 100 cubic feet per hour at maximum exertion.

In a crowded room such as a theater, this heat and moisture loading would render the air uninhabitable in a matter of minutes and therefore has to be satisfied by large scale ventilation works. Since relatively small ranges of temperature can be tolerated, the heat load from occupants in such space requires large volumes of air to be circulated.

In most indoor spaces, however, the determining factor on rate of air circulation is not temperature control but dilution of body odors. The unusual feature of this problem is that these odors can only be detected upon entering a room and are entirely unnoticed by a person who has been exposed to them for several minutes. The requirement, therefore, is for sufficient fresh air to make odors undetectable on entering a room. This requirement usually determines the rate of air changes needed as well as the amount of outdoor air. Room odors can be greatly intensified by smoking, as tobacco smoke is one of the few substances whose odor intensifies with time.

Two other effects of human occupancy on indoor air have, through the centuries, occupied man's attention. The first is the effect of human repiration on the chemical composition of air with particular attention to oxygen and carbon dioxide. Deaths in confined spaces are frequently erroneously attributed to oxygen depletion; as for example, the case of the "Black Hole of Calcutta."

When inspired air contains 20.91 percent oxygen (by volume), expired air contains 16 percent oxygen. Since humans at rest breathe only 15 cubic feet of air per hour, a little computation will quickly indicate that the victims of the "Black Hole" would succumb from heat prostration before oxygen depletion became a factor. Similarly, carbon dioxide produced by respiration, even though exhaled air contains 4 percent CO_2 by volume, is usually so diluted by air admitted for ventilation that this chemical contaminant from human origin can be safely ignored.

The big unknown in the effects of human occupancy on indoor air is bacterial dispersion. Studies on the relative occurrence of respiratory illness in spaces with and without air disinfection have been largely inconclusive. Except for liquid droplets, expired air contains no pathogens; in fact, is virtually sterile. Considering now the droplets, coarse droplets (exceeding 1 mm. in diameter) settle rapidly while fine droplets (less than 1 mm. in diameter) evaporate quickly to leave "condensation nuclei" suspended in the dry air and few pathogens can withstand drying for long.

These facts led Rosenau many years ago to make his still respected appraisal of disease transmission by air: "The danger is contracted in space, limited in time, and restricted to a few diseases."

Effects of Industrial Processes on Indoor Air

From earliest times it has been recognized that certain occupations were associated with massive pollution of the air breathed by workmen, particularly in closely confined spaces. Mining and metal refining are two cases in point. With the advent of World War I and the great increase in the diversity of chemical substances used in industry and particularly the large scale introduction of organic solvents into industrial technology, the subject of pollution of indoor air, expanded explosively in scope and diversity.

During the four decades since World War I, this trend has continued unabated until today industrial processes result in the release to the workroom atmosphere of almost every chemical substance known.

Fortunately, beginning with World War II, close and careful check has been kept by most states on the quality of workroom air, and poisonings have been relatively rare, so that industrial process workers need no longer live in fear of their job exposures.

This fortunate result has been achieved through programs of industrial hygiene carried out by labor departments in some states and by health departments in others. These programs rest upon a firm body of working knowledge concerning the tolerance of the human body to atmospheric contaminants. The tolerances are called "maximum allowable concentrations" (M. A. C.'s). For any substance the M. A. C. represents a concentration of the substance in air to which workers can be exposed eight hours per day, six days per week for a working lifetime without either damage or undue discomfort.

In the early days, the M. A. C.'s were determined directly and empirically by comparing, in retrospect, the average measured concentrations of contaminants with the record of poisoning or damage to persons with long terms of exposure to the conditions measured. This procedure is of course no longer tenable and M. A. C.'s for new and proposed substances are now determined primarily by animal experimentation.

The physical state of the chemical substance in the air has a very pronounced influence on its rate of absorption by the human body as well as on the pattern of distribution in the air and the type of exposure of the workman. Coarse particulate matter, for example, settles out of the air rapidly and cannot penetrate very far into the human respiratory system, while fine particulate matter may be permanently air-borne and can reach the inner passages of the lung. Solubility in body fluids is another factor of prime importance since atmospheric contaminants enter the human tissues only by solution, so that absolute toxicity is sometimes less important than solubility. In this connection one must remember that absorption of inhaled gases is entirely a different matter from the absorption of inhaled particulate matter, either liquid or solid.

For these reasons industrial atmospheric contaminants are classified first in terms of the following five categories:

Dusts—solid particles produced by fracture.

Gases—substances which unmixed with air are normally in the gaseous state.

Vapors—the vapor of substances which unmixed with air are normally in the liquid state.

Fumes—solid particles (usually metallic oxides) resulting from the condensation of solid substances which have been heated to the point of evaporation.

Mists—liquid droplets produced by condensation, or by the bursting of gas bubbles at a liquid surface as in a plating tank.

IMPERFECT VENTILATION.
Fig. 1.

Fig. 1. The waves of pure air are seen entering, ascending & passing directly out at the opening near the ceiling C into the exhaustion shaft.

PERFECT VENTILATION.
Fig 2.

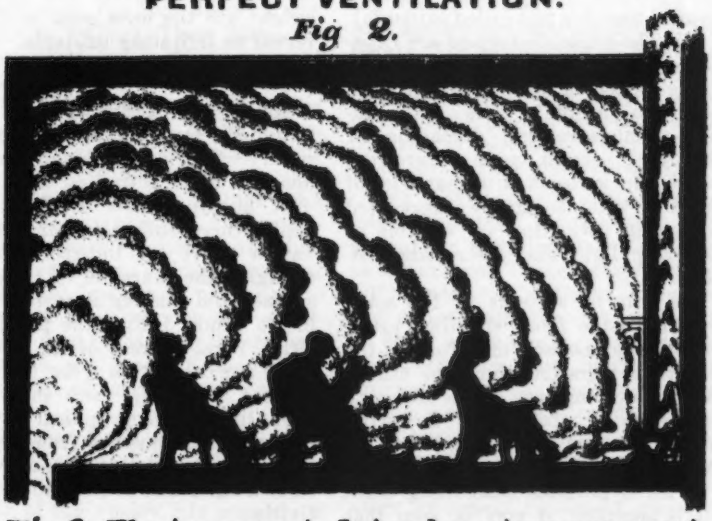

Fig. 2. The impure air, being heavier, passes out, as soon as created, at the opening in the base of the chimney for exhaustion Shaft.

Ventilation was recognized as a public health problem almost a hundred years ago as can be seen by the two illustrations shown above taken from the first report of the California State Board of Health in 1871

Illustration from first report of the State Board of Health in 1871

M. A. C.'s for gases and vapors are usually expressed in parts per million by volume (p.p.m.$_v$), those for fumes and mists and toxic dusts are expressed in milligrams per cubic meter (mg/M^3), while M. A. C.'s for nontoxic dusts are expressed in millions of particles per cubic foot (m.p.p.c.f.).

In a very general way, industrial air contaminants can be grouped by effect on the human system: halogenated hydrocarbons affecting the liver and other viscera; aromatic compounds affecting the blood; metallic compounds depositing in the bones, etc. Actually, however, every compound must be assessed on its own individual basis. For this reason, and because modern industry employes so many thousands of chemical compounds, two or more of which may be simultaneously inhaled, it may be seen that the field is complex and that control agencies are always in the position of trying to catch up with a rapidly changing picture.

Effects of Urban Activities on Outdoor Air

Although the subject of this conference is indoor air, outdoor air constitutes what might be thought of as the raw material for indoor air, and consequently anything that changes its chemical composition must be taken into consideration. This is especially true since most buildings are not provided with any means for removing chemical impurities in air admitted.

Outdoor air pollution usually develops in urban areas in three stages which may be entirely separate in time but which usually overlap. The *first stage of air pollution* is that of individual point-source problems. For example, smoke, dust, or gas is discharged from a single stack and adversely affects an adjacent area. This type of air pollution is characterized by the following features:

(1) The contaminant moves by simple linear displacement with limited dilution with clean air.
(2) There is no change in chemical composition or physical state of the contaminant.
(3) The zone of influence is restricted to a small downwind area.

The *second stage of air pollution* to occur as an area develops is pollution of the entire air mass in a metropolitan area. This type of air pollution is

based on the concept that the total "loading" of air contaminants discharged to the atmosphere is too great to be adequately diluted by the available air supply. It is a concept of too many tons of contaminant per cubic mile of air. This type of air pollution has one characteristic in common with the first stage, i.e., there is no change in the chemical composition or physical state of the contaminants after they reach the air. This stage of air pollution does, however, introduce the following entirely new considerations:

(1) A knowledge of the available air supply on a given day requires knowledge of the topography of the air basin, the effective "ceiling height" as determined by the temperature structure of the air in the basin, and the ventilation rate as governed by horizontal wind motion.
(2) Many types of contaminants are simultaneously present.
(3) It is not possible to relate an adverse effect on a small group of people to a single offender.

Coping with this type of air pollution requires a knowledge of the overall inventory of substances discharged daily to the atmosphere and a knowledge of the daily meteorological characteristics of the area.

Measurement of the intensity of air pollution of this type is achieved by systematic, continuous monitoring with automatic instruments at a network of stations throughout the area.

This is the type of air pollution which for many years plagued the cities of Pittsburgh and Detroit and which recently has been successfully controlled in those areas. This problem to a greater or lesser degree faces every metropolitan area in the United States and has for years been a matter of concern to the industrialized cities of Europe.

The *third stage of air pollution*, and the one which is only now beginning to be understood, is that which, for lack of a better name, has come to be called "smog." First recognized in Los Angeles, California, at the beginning of World War II, it has now not only spread to the other metropolitan areas of California but has been recognized in other parts of the United States. The putting together of the jigsaw pieces of the smog picture has been a most amazing chapter in scientific history and constitutes a true detective story, stranger than fiction. In reaching even the present imperfect understanding of this phenomenon it has been necessary to abandon some of our most cherished "common sense" assumptions. After 10 years of almost frantic research at a cost of well over 10 million dollars, the following characteristics of smog can be listed with reasonable assurance:

(1) Smog results from reactions taking place in the atmosphere itself between precursors (raw materials harmless in themselves at the concentrations found), catalysts, and atmospheric oxygen which form new compounds not originally present.

(2) These reactions take place between gaseous compounds at extraordinarily low concentrations (less than one part of precursor or catalyst to one million parts of air).

(3) Energy in the form of sunlight is necessary for these reactions to proceed and in the absence of sunlight the reaction is partially reversible.

(4) The precursors of these reactions are hydrocarbons; the principal catalyst is nitrogen dioxide (NO_2); and the reaction products are oxidized hydrocarbons and ozone (usually grouped together and called oxidants).

(5) The oxidants formed are capable, even at extremely low atmospheric concentrations, of causing irritation to people's eyes and mucous membranes and damaging or destroying certain types of growing plants. The aerosols (tiny particles of liquid or solid substance) associated with smog formation are capable of scattering light and destroying visibility.

The role of aerosols in the smog problem, aside from visibility interference, that aerosols may furnish the needed surfaces on which the atmospheric reactions take place and may also serve to absorb the irritating gaseous reaction products so as to intensify their effects on humans.

If his hypothesis concerning aerosols is accepted, it may be seen that smog results from the simultaneous existence in air of four factors: hydrocarbons + NO_2 + sunlight + aerosols = smog.

It follows that complete elmination of any one of these necessary factors would eliminate smog. Such complete elimination, however, seems impossible; hydrocarbons are the basis of our liquid and gaseous fuels; nitrogen dioxide is produced in every combustion of fuel as well as by natural reactions in the upper air; elimination of sunlight is unthinkable even were it possible; and production of aerosols is so inextricably linked with human activity and natural phenomena that the earth's atmosphere may be thought of as already contaminated on a worldwide basis. Increasing the natural ventilation of a metropolitan area by artificial measures does not appear feasible in the near future, nor does it seem practical to envisage moving a major city out of its existing location in a topographic basin.

This, then, is the smog dilemma. The solution seems to lie in modification of the activities of man to reduce the escape to the atmosphere of hydrocarbons, oxides of nitrogen, and aerosols to the lowest achievable level and then to avoid a *concentration of such activities* as will overload the air supply of any area. It should be noted that it is an oversimplification to refer to hydrocarbons as a group as though all hydrocarbons are equally effective as the precursors of smog. Research has indicated that unsaturated hydrocarbons of relatively low molecular weight are the ones most easily converted to irritating oxidants.

Effects of Rural Activities on Outdoor Air

Many rural activities have a profound and far-reaching although temporary effect on the quality of outdoor air. Some activities, such as sawdust burning, have a direct effect while others, such as asparagus cultivation exert an indirect effect by changing the character of the ground surface and making it more vulnerable to winds. Unlike the problems in cities, rural sources of air pollution, with one exception (the testing of nuclear weapons), exert their effects over limited geographical areas so that air quality varies from region to region and reflects the nature of localized agricultural and industrial activities.

The principal rural air pollution problems which have come to public notice in California during the last decade, as pointed out in the first report of *Clean Air for California* were: dust storms; smoke and charred sawdust from sawdust burners; dust clouds from turkey ranches; peat dust

clouds in the Delta area; dust from cement plants; dust, smoke, irritating vapors and odors from hot road mix plants; odors from faulty disposal of organic industrial wastes; toxic aerosols from the use of insecticides; smoke from orchard heating; fallout from nuclear weapons testing.

Dust storms are not new. They have occurred with increasing frequency and severity in the San Joaquin Valley during recent years apparently as a result of the cultivation of marginal lands. Dust clouds raised by high winds may virtually paralyze transportation by automotive vehicles, and make the air almost unbreathable for days at a time.

Smoke and charred sawdust from the conical sawdust burners used in sawmills in the lumbering areas of Northern California frequently fill the narrow mountain valleys. This not only creates a severe nuisance for the residents but at times causes visibility to be so low that it stops vehicular travel.

Dust clouds from turkey ranches have proved to be a most troublesome problem in recent years. Several hundred large flocks of turkeys, some of them numbering over 50,000 birds, are maintained in the San Joaquin and Sacramento Valleys. These flocks are kept on relatively small acreages of land, and the ground becomes partially denuded as a result. At feeding times when thousands of birds run across the ground flapping their wings, dense clouds of dust rise into the air and envelop whole areas for a distance of several miles. Under certain atmospheric conditions, the dust clouds, including fragments of feathers and feces, may persist more than a day. They are not only a nuisance but may cause allergic reactions in humans, and present the risk of transmission of bacterial and virus infections.

Peat dust clouds in the delta are peculiar to the area around Stockton. The delta lands, formed by the decomposition of tule rushes into peat which is pure enough to burn, give rise to severe peat dust storms. These are associated primarily with the raising of asparagus. The suspension of irrigation of asparagus fields at harvest time, and the practice of "mounding" to produce white asparagus, combine to leave a fine powdery soil completely at the mercy of the winds which frequently sweep through this area. Stockton, Lodi and other towns 20 or more miles from the fields where the dust clouds originate, are periodically visited by a series of dust storms of serious proportions. The adjacent agricultural lands are, of course, even more severely exposed.

Dust from cement plants is a complaint of long standing in California, especially in rural areas of the State. Very expensive equipment is needed to control the dust emission from cement plants. Cement dusts, whose effects from a single plant may be felt over many square miles, create a nuisance to people and cause damage to property.

Hot road mix plants in California are numerous and their location near suitable sources of gravel and sand usually places them in isolated rural spots. The process of classifying and blending the different sizes of rock and sand, and coating the material with hot asphaltic binding compounds produces not only intense dustiness, but also a variety of obnoxious petroleum vapors. These are irritating to the mucous membranes and potentially toxic or carcinogenic. Neighboring residents usually have strong feelings against the establishment of such plants. The small scale of operations and diversity of pollutants makes installation of adequate controls expensive but the present practices in this industry are not satisfactory from the standpoint of air pollution control.

The treatment and disposal of organic industrial wastes cause widespread air pollution in rural as well as urban areas. Domestic sewage by itself is relatively uniform in composition and strength throughout the year. In areas where liquid wastes from the food industries must be disposed of, however, the overwhelming organic strength of such wastes places a seasonal peak on the treatment facilities. This overtaxing almost invariably releases to the air hydrogen sulfide and other extremely obnoxious gases and vapors.

Agricultural insecticides sometimes result in toxic aerosols. Many thousands of tons of toxic chemicals are dispersed into the air each year for the control of insects and other pests, but at the same time exposing many people. The use of insecticides is an illustration of deliberate, intentional pollution of the atmosphere to control a severe threat to well-being, such as mosquito-borne disease or crop damage.

Smoke from orchard heating was a serious problem in the citrus belt of Southern California in the early decades of the century, when orange and lemon growers believed that smoke, as such, was desirable to keep the sun from hitting the fruit following a frosty night. Smudge pots were frequently selected for their smoke as well as heat; on cold nights oil would be burned in open pans and rubber tires would be piled up and fired. When it was found that smoke itself was of no value, the heaters were made less smoky and tall stack heaters began to replace the squat ones. Wind machines came into use and coke burning began to replace oil.

The later 1940's saw the replacement of old-style heaters with the new smokeless type, not only in Los Angeles County but also in the adjoining Counties of Ventura, San Bernardino, Riverside, and Orange. During the last few years, the wholesale removal of orchards to make way for residential subdivisions has further reduced the production of smoke from orchard heating. Today the problem has only a faint resemblance to that of the early days, but is still one to be reckoned with.

Fallout from nuclear weapons testing. The testing of nuclear weapons has not only introduced the first instance of an air pollution source that exerts its effects on a worldwide basis but has also introduced an entirely new characteristic to air pollution, that of fallout. The mushroom cloud from a nuclear explosion rises customarily to heights of 20,000 feet or more and thus enters the stratosphere; although small portions of the cloud may break off at lower elevations. Relatively large particles in the cloud (exceeding 100 microns in diameter) tend to settle out in the first few hours and are therefore largely confined to the vicinity of the explosion. Finer particles, however, remain airborne for much longer periods of time, some particles being so small as to behave as gas molecules. Some of these air-borne particles settle slowly to the surface after wide dispersion over the earth while some are brought

down by rain or snow. The unique feature of fallout is that it starts as an air contaminant but ends up as a deposit on land or vegetation or water.

Standards of permissible concentration of radioactivity in water and food and in air, both as suspended particulate material and as gamma radiation from all sources including deposits on the ground, have been established and are used by official agencies to appraise the public health aspects of radioactive fallout. To date a margin of safety exists between radioactivity levels in air and other environmental factors and these permissible levels of exposure. It is the task of official agencies to keep track of the slow shrinkage in the margin of safety to make sure that it does not disappear.

The Need for Co-ordination

From the foregoing discussion it is inescapably clear that the composition of air is a matter of basic importance to man in all of his activities. I believe it is equally apparent that activities related to studying and controlling air composition are widely scattered among groups of people whose activities are not co-ordinated in any way. In fact one might say with considerable truth that those entrusted with the stewardship duty of guarding air quality for society do not even acknowledge each other's existence, let alone compare notes.

I believe that the most urgent priority in this field is that the many bodies of information bearing on air quality suited to human beings be collated to the end that a mutual understanding of the subject develops and, that the activities of all be oriented in at least the same general direction.

California's Influenza Pattern Not Following Nation's

In contrast with the rest of the Nation, California is not experiencing a sharp upswing in the incidence of influenza among adults following outbreaks among school children, nor has there been an increase in the State's total death rate.

From information now available, it seems probable that the peak of school outbreaks, which have dominated the influenza picture in California, was reached approximately the third week of October. Since then the incidence in the school population has declined. There has been some increase in respiratory illness among the adult population over the past several weeks; however, there has been no evidence of disruption of community services from influenza.

Estimates place the number of new cases of respiratory illness in California at 550,000 for the week ending November 1st. During the succeeding week, ending November 8, the incidence decreased to an estimated 400,000.

Reports by the Communicable Disease Center, U. S. Public Health Service from other parts of the Country have indicated a marked increase in the number of influenza cases among adults about one to two weeks following school outbreaks. In the United States as a whole, the incidence of influenza has increased over the past several weeks with the most notable increases in the northeastern and midwestern states. All states except North Dakota have reported outbreaks of influenza. Twenty-one percent of the total counties of the United States have had one or more localized outbreaks.

The disease continues to be mild in nature with very few complications. Only 48 deaths associated with influenza have been specifically reported to the California State Department of Public Health since June, 1957. Although other deaths associated with influenza undoubtedly have occurred but have not been individually reported, it is still an extremely low death rate in relation to the number of cases that have occurred in California.

For the past several weeks, the total death rate in the United States as reflected by statistics from 108 cities has been above that anticipated for this time of year. The most striking increase has again been in the northeastern and midwestern sections of the Country. California has not experienced an increase in total death rate above that normally expected.

The vaccine release as of October 31st totaled 28,500,752 cc. nationally, with 2,250,833 cc. available for California. Precise information is not available on the distribution within California.

Recruitment Program Drafted For Laboratory Personnel

An organized and aggressive plan to interest more young people in seeking training in the profession of clinical laboratory technology has been drafted by organizations interested in the field.

Recognizing the fact that trained, professional persons in this field are in short supply, a program to attract students into clinical laboratory technology is being formulated by the California Society of Pathologists, California Association of Clinical Laboratories, California Association of Medical Laboratory Technicians, representatives of colleges and universities and members of the California State Department of Public Health.

A survey of the profession, undertaken by this department at the request of the interested organizations, disclosed that California needs approximately 800 new licensed individuals in clinical laboratory technology annually, about 200 more than are available each year.

Both a long range and an immediate approach to the problem is contemplated. From a long range point of view, active and continuing association by professional representatives with junior high school and high school students is planned in an effort to interest them in such a career.

Immediate considerations include improvement of working conditions and re-evaluation of college curriculums. Working conditions may be improved in several ways, but one important consideration is the greater use of laboratory helpers who can do many nontechnical functions and clerical jobs in order to preserve the professional laboratory people for technical duties.

Clinical laboratory functions are increasing in number and complexity. Today's physicians rely heavily on clinical laboratory results in making diagnoses and in outlining courses of treatment. Professional workers in this field deserve the status they have earned as scientists in a vital occupation. The program outlined above is designed to establish these important functions as desirable activities for future graduates and for those currently in the profession.

Mental Health Act Implemented, Rules and Regulations Adopted

Following adoption of amendments liberalizing local mental health programs and their administration, the California Conference of Local Health Officers acting as the California Conference of Local Mental Health Directors, approved the rules and regulations drafted by the State Department of Mental Hygiene at public hearings in San Francisco, October 25, 1957.

Under the revised regulations, local governing bodies can contract with a profit-making agency for inpatient and outpatient services, and areas which have not been able to recruit a complete staff of psychiatrist, psychologist and social worker as specified in the Short-Doyle Act can be considered eligible for reimbursement for that part of the staff which they have been able to employ.

The rest of the rules and regulations were approved, with minor changes, as presented by the California State Department of Mental Hygiene to the conference.

The Short-Doyle Act, passed during the last session of the Legislature, specifies that until 12 local mental health programs are established and 12 administrators have been appointed, the conference of local mental health directors will consist of members of the California Conference of Local Health Officers.

Three local health officers have been designated as local mental health directors. They are: Dr. Russell S. Ferguson, Santa Cruz County; Dr. Myron W. Husband, Monterey County; and Dr. Dwight M. Bissell, San Jose City. It is expected that other local health officers may assume responsibility for directing the mental health programs in their areas.

At the present time 14 local jurisdictions have established mental health programs which are eligible for funds under provisions of the Short-Doyle Act. They are: Contra Costa, San Mateo, Napa, Santa Cruz, Ventura, Los Angeles, Sonoma, Monerey, Alameda, Fresno, San Luis Obispo and San Francisco County; Humboldt-Del Norte bi-county and Los Angeles City.

Ten local health departments currently have psychiatrists on their staffs. They are: Ventura, San Francisco, San Mateo, Santa Cruz, Monterey, Los Angeles and San Diego County, and Los Angeles, Long Beach and Berkeley City.

Reported Cases of Selected Notifiable Diseases—California, Month of October, 1957

Disease	*Cases reported this month*			*Cumulated cases from January* [1]		
	1957	*1956*	*1955*	*1957*	*1956*	*1955*
Amebiasis	253	114	45	1,781	815	586
Anthrax	1	--	--	1	--	--
Botulism	--	1	--	2	5	1
Brucellosis	4	5	4	43	27	48
Chancroid	7	15	5	52	77	121
Cholera	--	--	--	--	--	--
Coccidioidomycosis [1]	13	36	22	158	160	120
Conjunctivitis, acute infections of the newborn	1	--	--	4	7	8
Dengue	--	--	--	--	--	--
Diarrhea of the newborn	23	5	--	42	11	18
Diphtheria	--	2	--	8	28	16
Encephalitis, acute [2]	46	55	30	488	488	354
Epilepsy	218	345	230	2,593	3,022	2,285
Food poisoning	277	454	86	1,107	1,627	1,332
Gonococcal infections	1,736	1,631	1,075	13,763	12,993	12,314
Granuloma inguinale	2	--	--	7	1	2
Hepatitis, infectious	153	217	149	1,618	1,646	1,569
Hepatitis, serum	15	7	2	85	77	47
Leprosy	--	1	2	13	7	17
Leptospirosis	--	--	--	1	3	2
Lymphogranuloma venereum	2	1	5	17	27	29
Malaria	7	4	2	34	43	29
Measles	436	764	598	52,537	30,653	66,341
Meningococcal infections	23	8	11	148	205	211
Mumps	972	1,156	1,793	17,549	31,408	30,141
Pertussis (whooping cough)	344	181	265	2,425	1,905	4,596
Plague	--	--	--	--	1	--
Poliomyelitis—						
Total	84	300	297	641	1,946	1,697
Paralytic	54	168	179	254	1,250	890
Nonparalytic	30	132	118	387	696	801
Psittacosis	2	9	8	26	37	36
Q fever [3]	1	1	4	39	53	15
Rabies, animal	25	16	50	162	262	307
Rabies, human	--	--	--	1	--	--
Relapsing fever	--	--	2	3	--	--
Rheumatic fever	11	7	14	120	107	177
Rocky Mountain spotted fever	--	--	1	--	1	4
Salmonellosis	253	92	118	1,396	960	858
Shigellosis	237	187	143	1,466	1,476	1,033
Smallpox	--	--	--	--	--	--
Streptococcal infections (including scarlet fever)	565	356	288	6,920	4,480	6,437
Syphilis	665 [a]	599	512	5,168 [b]	5,238	5,719
Tetanus	5	3	2	27	27	30
Trachoma	--	--	1	81	4	7
Trichinosis	--	--	4	7	9	8
Tuberculosis	545	718	570	5,512	6,105	6,095
Tularemia	--	--	1	2	4	4
Typhoid fever	24	11	15	71	91	86
Typhus fever, endemic	3	1	1	9	3	2
Typhus fever, epidemic	--	--	--	--	--	2
Yellow fever	--	--	--	--	--	--

[1] Since July 1, 1955, active primary (including cavitary) and disseminated coccidioidomycosis reportable.

[2] Encephalitis, acute includes arthropod-borne infections, post infectious cases, and those with etiology undetermined.

[3] NR—Not reportable prior to July 1, 1955.

[a] Excludes 736 cases found positive by special serologic survey (Mexican national farm workers at Border Reception Center, El Centro).

[b] Excludes 10,431 cases found positive by special serologic survey (Mexican national farm workers at Border Reception Center, El Centro).

The flight range of the *Aedes nigromaculis* in California is seven and one-half miles.—*Mosquito News*, December, 1956.

Edward A. Reinke Receives Award

Edward A. Reinke, Chief of the Bureau of Sanitary Engineering, California State Department of Public Health, was presented the George A. Elliott Memorial Award by the American Water Works Association —California Section at their annual meeting held in San Jose on October 29th and 30th.

Mr. Reinke was honored in recognition of his years of devoted service to the California Section of the association; his conscientious service on numerous committees, including the Committee on Preparation of Water Supply Standards whose recommendations have become part of state law; and his untiring efforts to support the right of water purveyors to protect the quality of their water sources.

He is currently chairman of the section's Committee on Water Quality. In 1950 he was chairman of the section.

Public Health Positions

Imperial County

Sanitarian: Salary range, $369 to $535. Starting salary $430 or higher, depending upon experience and training. Must be eligible for registration by the State of California. Two positions open. For further details write Austin W. Matthis, M.D., Health Officer, Imperial County Health Department, 1007 Hamilton Avenue, El Centro.

Kern County

Public Health Physician: Salary range. $673 to $818. Must be licensed to practice medicine in California. Applicants with public health experience will be given preference. Write William C. Buss, M.D., Health Officer, Kern County Health Department, P. O. Box 997, Bakersfield.

Death Ends Distinguished Career

Lincoln T. Smith, Supervising Cannery Inspector, in the Bureau of Food and Drug Inspection, died November 9, 1957, at Long Beach after a brief illness. Mr. Smith joined the California State Department of Public Health as a cannery inspector in 1926. He worked in this capacity in Los Angeles, San Francisco and Sacramento until 1934 when he was assigned to Terminal Island. He became Assistant Supervising Cannery Inspector in 1947 and Supervising Cannery Inspector in 1949 and has been in charge of the fish inspection in Southern California for the past several years.

Mr. Smith was one of the original group of employees who was so instrumental in the development of the Cannery Inspection Section. He was held in high esteem by all his fellow employees as well as the members of the fish canning industry.

Mr. Smith was born in Sacramento June 2, 1899, and was a veteran of World War I. He is survived by his widow Rose, who is also employed by the Bureau of Food and Drug Inspection, Cannery Inspection Section, a daughter Linda, a son Richard, a married daughter Barbara Hess and three grandchildren.

The influenza virus was first isolated in 1931 from the pig, two years later it was isolated from humans.

Suicide is the fifth most frequent cause of death in United States adolescents (ages 15 to 19).—*Family Life*, October, 1957.

Health Officer Changes

Lassen County

Fred J. Davis, Jr., M.D., has been named health officer for Lassen County, effective July 1, 1957. He succeeds Robert J. Carson, M.D.

Pasadena City

Morris L. Grover, M.D., recently replaced Arthur J. Holmes, M.D., as health officer for the City of Pasadena. Effective date of the appointment was November 1, 1957.

Sutter-Yuba County

Leon M. Swift, M.D., has succeeded Ray C. Lindsay, M.D., as health officer of the Sutter-Yuba Bi-county Health Department. The appointment date was November 1, 1957.

GOODWIN J. KNIGHT, Governor
MALCOLM H. MERRILL, M.D., M.P.H.
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